

the electrodes or the signal lines and the liquid crystal layer, which is made of an insulating layer and an orientation film, or a protective film, for example, that may also serve as these films, and there are regions in which the thickness of the insulating layer and the orientation film together is less than 1000 Å and preferably less than 500 Å. Here, an electrode in a pure in-plane electric field mode element refers to the pixel electrode and the storage electrode or common electrode associated (accompanying) therewith. In-plane electric field elements falling under a broader definition, such as HS, further include other electrodes, for example. Also, it is even better if the total film thickness of the insulating layer and the orientation film, for example, between the pixel electrode and the liquid crystal layer and the common electrode and the liquid crystal layer is less than 500 Å, or if there are sections without these layers. It should be noted that if there is no orientation film or if there are regions in which there is partially no orientation film, then in these areas it may be preferable that some other orienting means has been devised. Of course, if below a black matrix (opposite the user side), for example, then such measures are not necessary. Moreover, in line

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with future technological advances, a liquid crystal material that does not require an orientation film may also be used.

Page 14, lines 20 to 25, cancel and replace with the following:

Thus, ions and charges in the liquid crystal are shifted and ions or charges in the liquid crystal molecules and the liquid crystal layer are eliminated and the misalignment, for example, of liquid crystal molecules at defective insulating portions, for example, is also eliminated, and thus, a favorable display is attained.

Page 37, lines 23 to 24, cancel and replace with the following:

Fig. 81 is structural diagram of an EL display adopting the present invention.

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Page 40, lines 1 to 5, cancel and replace with the following:

First Inventive Group

This major inventive group is made up of two inventive groups, and relates to a resin for sealing the liquid crystal injection port.

First Inventive Group

Page 40, lines 18 to 25, cancel and replace with the following:

In a second aspect, warming the substrate side by infrared (I.R.) light, for example, when the UV curable resin is applied to the injection port, or heating by warming only the resin once it has been applied or the entire substrate, has the effect of substantially lowering the viscosity of the resin. Also, if the viscosity of the resin becomes a viscosity of no more than 20Pa s due to this heating, then the resin hardly contains bubbles anymore, which is even better.

Page 44, line 10 to Page 45, line 8, cancel and replace with the following:

The liquid crystal element of the present embodiment is shown in Fig. 12. As shown in Fig. 12, the liquid crystal element has a pixel electrode 4 and a common electrode 5 for generating an electric field substantially parallel to the surface of an insulating film 81 formed over the entire surface of an array substrate 1. There is an insulating layer 8 and an orientation film 9 (strictly speaking, in Fig. 12 the top portion of the insulating layer and the orientation film) serving as a third layer between a liquid crystal layer 3 and the metal layer made of the pixel electrode 4, the common electrode 5 and the signal line 6, for example, (strictly speaking, this may also be an electrode made by a non-metal such as ITO; also, in principle the bottom of the insulating material and the orientation film are at an identical height from the substrate surface between the metal lines and the metal electrode) and which are different than the above-mentioned metal layer and liquid crystal layer, and there is a region in which the thickness of the insulating layer 8 and the orientation film 9 together is smaller than 500 Å. More specifically, due to the manufacturing circumstances, there

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is another normal insulating film 81 or a protective layer (not shown), for example, above or below the electrodes of the pixel electrode 4, the common electrode 5, and the signal line 6, etc. The total thickness of the insulating layer and orientation film, for example, serving as a third layer interposed between the liquid crystal layer and the metal layer is extremely thin at 1000 Å or less, and is preferably thinner than 500 Å. In the drawing this thickness is 400 Å.

Page 48, lines 11 to 25, cancel and replace with the following:

The liquid crystal element of the present embodiment is shown in Fig. 14. As shown in this drawing, in this liquid crystal element there is only the orientation film 9 between the liquid crystal layer 3 and the pixel electrode 4, the common electrode 5, or the signal line 6, and this orientation film 9 has regions that are less than 500 Å thick (in the drawing it is 300 Å). More specifically, there is ordinarily an insulating film and a protective film on the pixel electrode 4, the common electrode 5, and the signal line 6, for example, but in this case

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there is also a portion with regions lacking these films. In this portion there is only the orientation film, whose thickness is less than 500 Å.

Thus, similar to the previous embodiments, the concentrated ion species are recovered via the electrode, and black spot defects are eliminated. That is, the orientation film on the electrode is made even thinner, and concentrated ion species can be taken up even easier by the electrode than in the various previous embodiments.

Page 54, line 25 to Page 55, line 5, cancel and replace with the following:

Furthermore, a light-blocking material with metal chrome or a conductive polymer such as polypyrrole as the main constituent can be used for the neutralization electrode, and as shown in Fig. 20, it can be formed such that it blocks light at the gap between the gate signal line 7 and the common electrode 5 or the gap between the source signal line and the common electrode. In this case, a black matrix does not have to be formed on the color

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filter substrate, so that the number of process steps and the cost can be reduced.

Page 92, lines 10 to 15, cancel and replace with the following:

Orientation films are ordinarily very thin at 2000 Å or less, and therefore there are many pin holes in an orientation film. Consequently, when there are ionic impurities, which cause black spot defects in the liquid crystal, for example, electrons are transferred between the conductive light-blocking film and the ionic impurities, just like when there is no orientation film.

Page 98, line 27 to Page 99, line 1, cancel and replace with the following:

Fig. 66(1) shows the opposing substrate (glass substrate) configuration of the liquid crystal element of this embodiment.

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Page 101, lines 9 to 17, cancel and replace with the following:

In the previous third embodiment, the scanning line 7 and the common electrode 5 were formed on the glass substrate 1, the first insulating film was formed over these, and the semiconductor layer, the signal line, and the pixel electrode were formed on top of this, but in this embodiment, the signal line 6, the drain, the pixel electrode 4, and the semiconductor layer 16 are formed on the glass substrate 1, the first insulating film is formed over these, and the scanning line 7 the common electrode 5 are selectively formed over this.

Page 105, line 27 to Page 106, line 1, cancel and replace with the following:

2) The foaming agent is thermally decomposed, which makes the orientation film of the base highly porous.